

EPTESICUS DOUGLASI, A NEW VESPERTILIONID BAT FROM KIMBERLEY, WESTERN AUSTRALIA

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INTRODUCTION

Eptesicus is a wide ranging genus, most species of which occur in warm temperate and subtropical Asia and Africa. Smaller numbers of species are found in Europe, America, and Australia (Tate 1942). In Australia, Tate recognises only *Eptesicus pumilus* (Gray, 1841) and its weakly differentiated races: *E. pumilus caurinus* Thomas, 1914; *E. pumilus vulturinus* Thomas, 1914; *E. pumilus darlingtoni* G.M. Allen, 1933. The type of *E. pygmaeus* (Becker, 1858) is lost but Tate suggests from Becker's description that it also belongs to the *Eptesicus pumilus* group.

Tate (1942) considers that the Australian *Eptesicus* are separated from Asian mainland *Eptesicus* by about 2,000 miles. The six species of *Eptesicus* found in southern Asia do not extend eastwards from the Malay states; none are known from the Philippines or the East Indian islands west and north of New Guinea or Australia. More recent collections confirm that *Eptesicus* is not found in North Borneo (Davies, 1962), New Guinea, Celebes, and adjacent islands (Laurie, 1952; Laurie and Hill, 1954; Brass, 1959; Lidicker and Ziegler, 1968; and McKean, 1972), or New Caledonia, Solomon Islands and New Hebrides (Sanborn and Nicholson, 1950). There is, however, a doubtful record of *Eptesicus* from Sarawak (Perlot, 1968).

This paper describes a new species of *Eptesicus*, similar to *Eptesicus pumilus caurinus* but larger and of different colour. This new species occurs in sympatry with *E. pumilus caurinus*; both forms were captured in the same mist net at Tunnel Creek, Napier Range, and both were shot at the same place at approximately the same time in the Drysdale River National Park, and from nearby localities in the Prince Regent River Reserve.

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Holotype

M3405C; Western Australian Museum, male in alcohol, collected by D. Farner and D.L. Serventy, 10 October 1958, mist-netted at entrance of cave (this is the first specimen of *E. douglasi* collected).

Type locality

Tunnel Creek, Napier Range, Western Australia (17° 37'S, 125° 09'E).

Paratypes

(All are spirit specimens in Western Australian Museum.)

Tunnel Creek, Napier Ranges (17° 37'S, 125° 09'E):

M3405A (female) and M3405B (male), D. Farner and D.L. Serventy, 10 October 1958, mist-netted at entrance of cave. M14557 (male), M14558, M14559 (female), W.H. Butler, 22-23 June 1965, shot in cave, field numbers B1388-90, respectively, weights all 6.0 gm.

Prince Regent River Reserve (15° 31'S, 125° 13'E):

M12251 (male) and M12250 (female), N.L. McKenzie and J. Dell, respectively, 29 August 1974 and 25 August 1974, respectively, shot in Fern Gully which is described in detail in Miles *et. al.* (1975), field numbers W3/16 and W3/4, respectively, weights 4.5 and 4.3 gms, respectively.

Drysdale River National Park (14° 43'S, 126° 54'E):

M14016 (male), M14015, M14017 and M14018 (females), W.K. Youngson, 20-21 August 1975, shot flying against cliffs near water, field numbers C3-8, C3-7, C3-9 and C3-15 respectively, weights 3.0, 4.0, 3.0 and 3.0 gms, respectively.

Other *E. douglasi* specimen

M14014, Western Australian Museum, female in alcohol, W.K. Youngson, 20 August 1975, shot against cliffs along with paratypes from Drysdale River National Park, field number C3-1, weight not recorded. This specimen was badly damaged when shot.

Diagnosis

E. douglasi is a large *Eptesicus* with a long slender forearm. The head, foot and forearm when compared to the rest of the body are contrastingly light coloured. The baculum is large and in the lateral view is more strongly curved and with a larger and more rounded head proximally than *E. pumilus caurinus* (Fig. 1).

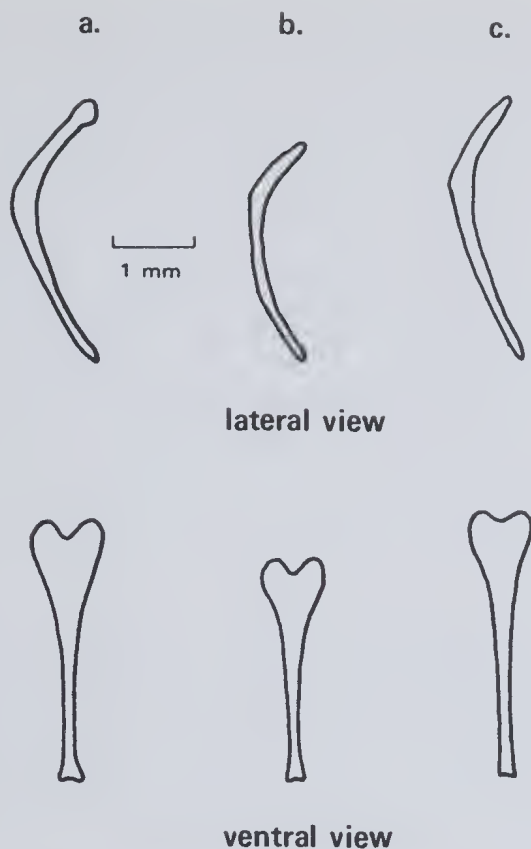


Fig. 1. Baculum, in ventral and lateral view, of (a) *Eptesicus douglasi* (M14557), (b) *Eptesicus pumilus caurinus* (M14013), and (c) *Eptesicus pumilus pumilus* (M14562).

Description

(a) Skull and Dental Characters: although *E. douglasi* is much larger than the *E. pumilus caurinus* collected sympatrically (see measurements, Tables 1 and 2), the general shape of the skull and teeth of the two taxa is very similar. *E. douglasi* does, however, have a narrower interorbital constriction expressed as a proportion of its rostrum (distance from I^1 to the least interorbital constriction) than does *E. pumilus caurinus* (.62-.70 compared to .71-.75).

(b) External Characters: the *E. douglasi* described herein are all preserved in alcohol; no skins were prepared. Fortunately, W.K. Youngson records in his field notes that the colour of *E. douglasi*, M14015, immediately after he shot it, had "distinct yellow-orange mantle and chest, lips and snout orange". These colours and presumably those of the other spirit specimens

(described following Ridgway's 1912, colour code) have faded somewhat and now appear, after careful drying and grooming of the pelage, as a pale orange mantle of fur on head, shoulders and throat, orange buff lips, snout, forearm and foot; fur on ventral and dorsal surfaces tipped with light greyish olive and pale olive buff, respectively, and with a clove brown base; a patch of ivory yellow hair posterior to the arms on the ventral surface; and a black patagium. The colour of the other *E. douglasi* alcohol specimens is similar; they all have a light coloured covering of fur on the head, throat and shoulders, and pale skin on the front of the face, forearm and foot. The light coloration of the face of *E. douglasi* highlights the large 'glandular' pads on the side of the snout giving its face a much less pointed appearance than that of *E. pumilus caurinus*, which lacks large nasal pads.

(c) Baculum: recent studies on bacula of *Eptesicus* in Australia have indicated that their shape may be used as a diagnostic character to distinguish between forms of this genus (J.L. McKean, *pers. comm.*).

Bacula were removed from *E. douglasi* (M3405B, M14016, M14557), *E. pumilus caurinus* from Drysdale River National Park (M14009, M14013), *E. pumilus pumilus* from Middle Creek, East Pilbara, Western Australia (M12666, M12668 and M12671), and Yardie Homestead, North West Cape, Western Australia (M5147 and M14562); and from a specimen from Halls Creek, southeast Kimberley, Western Australia (M6255), which is intermediate in size between *E. pumilus caurinus* and *E. pumilus pumilus*. The bacula of specimens in these taxa are represented in ventral and lateral view in Fig. 1.

The baculum of *E. douglasi* is slightly larger than any of the others examined and differs from the others in that the small horns at the proximal end are more swollen in the lateral view, and the curve of the baculum from the lateral view is more acute. The bacula from the forms of *E. pumilus* examined vary in size but are approximately the same shape.

(d) General: *E. douglasi* is apparently a cave bat. It was mist-netted at the mouth of Tunnel Creek in October 1958, and collected from inside the Tunnel Creek cave in June 1965.

The flight pattern of *E. douglasi* differed from that of *E. pumilus caurinus* in that it kept closer to the cliffs and was more difficult to shoot than the latter species (W.K. Youngson *pers. comm.*).

Female *E. douglasi* were collected from August, June and October. None had obviously enlarged uteri or swollen teats.

Remarks

E. douglasi is a distinct species from *E. pumilus*; it occurs in sympatry with *E. pumilus caurinus* from which it differs markedly in overall size and

colour, and slightly in shape of baculum. However, the differences in cranium, teeth and body form between *E. douglasi* and *E. pumilus caurinus* are no greater than the differences between the other weakly differentiated races of *E. pumilus* recognised by Tate (1942). It is possible then, that *E. darlingtoni* which was relegated to a subspecies by Tate (1942) and Ride (1970), and *E. pumilus vulturnus*, should be elevated to specific status.

Of the subspecies of *E. pumilus* recognised by Tate (1942), *E. pumilus darlingtoni*, although of different colour, appears nearest to *E. douglasi*. Measurements (in mm) taken from the paratype of *E. darlingtoni* (No. 29120) are as follows: greatest length 13.3, zygomatic breadth 8.6, inter-orbital breadth 3.8, braincase breadth 6.8, braincase depth 4.9, maxillary tooth row 4.9, post palatal length 5.2, palatal breadth 5.7, mandible C-M₃ 5.2, canine breadth 4.1, mastoid breadth 7.8, I¹ - least interorbital constriction 5.3, distance between bullae 1.4, head and body length 46.0, ear length 10.0, tragus length 6.8, radius length 36.2, tibia length 14.7, foot length 7.0.

Although the body measurements of *E. douglasi* listed in Table 2 are from spirit specimens and those from *E. darlingtoni* above are from a skin, they do suggest that the general body shape in these two taxa is similar (the ears of the *E. darlingtoni* specimen appear to have shrunk). Comparison of the skull and dental measurements and shape of these two taxa indicates that in *E. douglasi* the skull is shorter and relatively narrower at the back. It has slightly less inflated bullae and these, relative to the mastoid breadth, are closer together. The anterior margin of the orbit in *E. douglasi* is much more oval in shape than in *E. darlingtoni*, where it projects forward to a sharper angle. Further the rostrum in *E. douglasi* shows a tendency to be slightly longer relative to the greatest length of the skull, than is the case with *E. pumilus caurinus* — whereas Allen (1933) states that the rostrum of *E. darlingtoni* is slightly shorter than in *E. pumilus*.

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Table 1: Skull and Dental Measurements (mm) of *Epistesicus douglasi* and *E. pumilus caurinus*.

E. douglasi													
No.	M	M	M	M	M	M	M	M	M	M	M	M	M
Sex	♂	♂	♂	♂	♀	♀	♀	♀	♀	♀	♀	♀	♀
Locality (Kimberley District)	Orysdale River N.P.	Prince Regent River R.	Tunnel Creek	Tunnel Creek	Drysdale River N.P.	Drysdale River N.P.	Drysdale River N.P.	Drysdale River N.P.	Prince Regent River R.	Tunnel Creek	Tunnel Creek	Orysdale River N.P.	Orysdale River N.P.
Greatest length	12.7	13.0	-	12.6	12.9	-	12.3	13.0	12.7	13.0	13.1	12.4	11.3
Zygomatic breadth	8.3	8.1	8.2	8.1	8.2	8.7	8.4	8.4	8.3	8.5	8.8	-	7.3
Interorbital breadth	3.4	3.5	3.5	3.4	3.5	3.4	3.4	3.5	3.3	3.6	3.6	3.3	3.4
Braincase breadth	6.2	6.1	6.4	6.1	6.1	6.5	6.2	6.3	6.1	6.4	6.6	-	5.9
Braincase depth	4.9	5.0	-	4.9	4.8	-	4.8	4.8	4.8	4.8	5.1	4.7	4.3
Maxillary tooth row	4.6	4.7	4.7	4.6	4.6	4.7	4.5	4.8	4.7	4.5	4.7	4.6	4.0
Post palatal length	5.0	5.3	5.0	4.9	-	-	4.9	5.1	5.2	5.1	5.1	5.5	4.4
Palatal breadth	5.5	5.5	5.4	5.3	5.5	5.5	5.4	5.5	5.5	5.4	5.8	4.7	5.0
Mandible C-M3	4.9	5.0	5.0	5.0	4.9	4.9	4.8	5.1	5.1	4.9	4.9	4.3	4.3
Canine breadth	4.0	4.1	4.1	3.9	4.0	4.2	3.9	4.0	4.0	4.1	4.1	4.0	3.6
Mastoid breadth	7.0	7.1	7.2	6.8	6.7	7.3	7.0	7.4	6.8	7.3	7.0	6.4	6.6
l-l-least interorbital constriction	5.0	5.3	5.0	5.1	5.0	-	-	5.5	5.2	5.2	5.3	4.2	4.5
Distance between bullae	1.1	1.0	1.2	1.1	-	1.1	1.0	1.1	1.0	1.0	1.2	1.1	0.9
E. pumilus caurinus													
No.	M	M	M	M	M	M	M	M	M	M	M	M	M
Sex	♂	♂	♂	♂	♀	♀	♀	♀	♀	♀	♀	♀	♀
Locality (Kimberley District)	Orysdale River N.P.	Prince Regent River R.	Tunnel Creek	Tunnel Creek	Drysdale River N.P.	Drysdale River N.P.	Drysdale River N.P.	Prince Regent River R.	Tunnel Creek	Tunnel Creek	Tunnel Creek	Orysdale River N.P.	Orysdale River N.P.
Head and body length	40.6	37.8	39.6	37.5	37.8	38.9	34.1	37.6	39.4	38.5	42.9	40.2	34.8
Tail length	-	-	37.1	38.3	32.9	37.5	36.9	38.2	33.7	34.7	34.8	32.6	28.5
Ear length	11.6	12.5	-	11.7	11.6	12.7	12.5	12.3	11.5	11.9	12.5	12.3	10.7
Trausa length	6.0	6.7	6.1	5.9	6.1	6.1	6.0	6.2	6.7	6.1	6.3	6.3	4.6
Radius length	35.6	37.0	36.4	37.6	34.6	36.7	34.5	36.3	34.6	36.2	36.1	34.6	30.3
Tibia length	-	-	14.4	15.3	14.3	14.3	13.6	14.8	14.0	-	14.4	14.0	11.1
Foot length	-	-	6.4	6.1	-	6.6	6.5	5.8	6.6	5.9	5.9	6.3	5.3

Table 2: Body Measurements (mm) of *Epistesicus douglasi* and *E. pumilus caurinus*. (Measurements taken from fixed specimens.)

E. douglasi													
No.	M	M	M	M	M	M	M	M	M	M	M	M	M
Sex	♂	♂	♂	♂	♀	♀	♀	♀	♀	♀	♀	♀	♀
Locality (Kimberley District)	Orysdale River N.P.	Prince Regent River R.	Tunnel Creek	Tunnel Creek	Drysdale River N.P.	Drysdale River N.P.	Drysdale River N.P.	Prince Regent River R.	Tunnel Creek	Tunnel Creek	Tunnel Creek	Orysdale River N.P.	Orysdale River N.P.
Head and body length	40.6	37.8	39.6	37.5	37.8	38.9	34.1	37.6	39.4	38.5	42.9	40.2	34.8
Tail length	-	-	37.1	38.3	32.9	37.5	36.9	38.2	33.7	34.7	34.8	32.6	28.5
Ear length	11.6	12.5	-	11.7	11.6	12.7	12.5	12.3	11.5	11.9	12.5	12.3	10.7
Trausa length	6.0	6.7	6.1	5.9	6.1	6.1	6.0	6.2	6.7	6.1	6.3	6.3	4.6
Radius length	35.6	37.0	36.4	37.6	34.6	36.7	34.5	36.3	34.6	36.2	36.1	34.6	30.3
Tibia length	-	-	14.4	15.3	14.3	14.3	13.6	14.8	14.0	-	14.4	14.0	11.1
Foot length	-	-	6.4	6.1	-	6.6	6.5	5.8	6.6	5.9	5.9	6.3	5.3
E. pumilus caurinus													
No.	M	M	M	M	M	M	M	M	M	M	M	M	M
Sex	♂	♂	♂	♂	♀	♀	♀	♀	♀	♀	♀	♀	♀
Locality (Kimberley District)	Orysdale River N.P.	Prince Regent River R.	Tunnel Creek	Tunnel Creek	Drysdale River N.P.	Drysdale River N.P.	Drysdale River N.P.	Prince Regent River R.	Tunnel Creek	Tunnel Creek	Tunnel Creek	Orysdale River N.P.	Orysdale River N.P.
Head and body length	40.6	37.8	39.6	37.5	37.8	38.9	34.1	37.6	39.4	38.5	42.9	40.2	34.8
Tail length	-	-	37.1	38.3	32.9	37.5	36.9	38.2	33.7	34.7	34.8	32.6	28.5
Ear length	11.6	12.5	-	11.7	11.6	12.7	12.5	12.3	11.5	11.9	12.5	12.3	10.7
Trausa length	6.0	6.7	6.1	5.9	6.1	6.1	6.0	6.2	6.7	6.1	6.3	6.3	4.6
Radius length	35.6	37.0	36.4	37.6	34.6	36.7	34.5	36.3	34.6	36.2	36.1	34.6	30.3
Tibia length	-	-	14.4	15.3	14.3	14.3	13.6	14.8	14.0	-	14.4	14.0	11.1
Foot length	-	-	6.4	6.1	-	6.6	6.5	5.8	6.6	5.9	5.9	6.3	5.3

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